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## (12) United States Patent

Nemeh et al.

# (54) CONCURRENT TREATMENT OF ORAL AND SYSTEMIC MALADIES USING DIRECT CURRENT ELECTRICITY

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This patent is subject to a terminal dis-

claimer.

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(58) Field of Classification Search

See application file for complete search history.

#### (56) References Cited

#### U.S. PATENT DOCUMENTS

6,067,941 A *	5/2000	Axelrod	A01K 15/026
			119/707
8,660,669 B2*	2/2014	Nemeh	A61C 19/063
			433/216
(Continued)			

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#### (57) ABSTRACT

A method and apparatus for the concurrent treatment of multiple oral diseases and defects while promoting general oral hygiene utilizing electricity are provided for non-human animals. Electrodes are used to deliver an electrical current to the gingival tissues of a mouth in order to achieve a number of therapeutic, prophylactic, and regenerative benefits. These benefits include killing oral microbes, increasing oral vasodilation, reducing oral biofilm, improving oral blood circulation, reversing oral bone resorption, promoting oral osteogenesis, treating gum recession, and fostering gingival regeneration. Other benefits include the treatment of gingivitis, periodontitis, and oral malodor, and other systemic diseases correlated with oral pathogens.

### 2 Claims, 9 Drawing Sheets

